LA-UR-20-22180
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Title:	Nuclear Accidents
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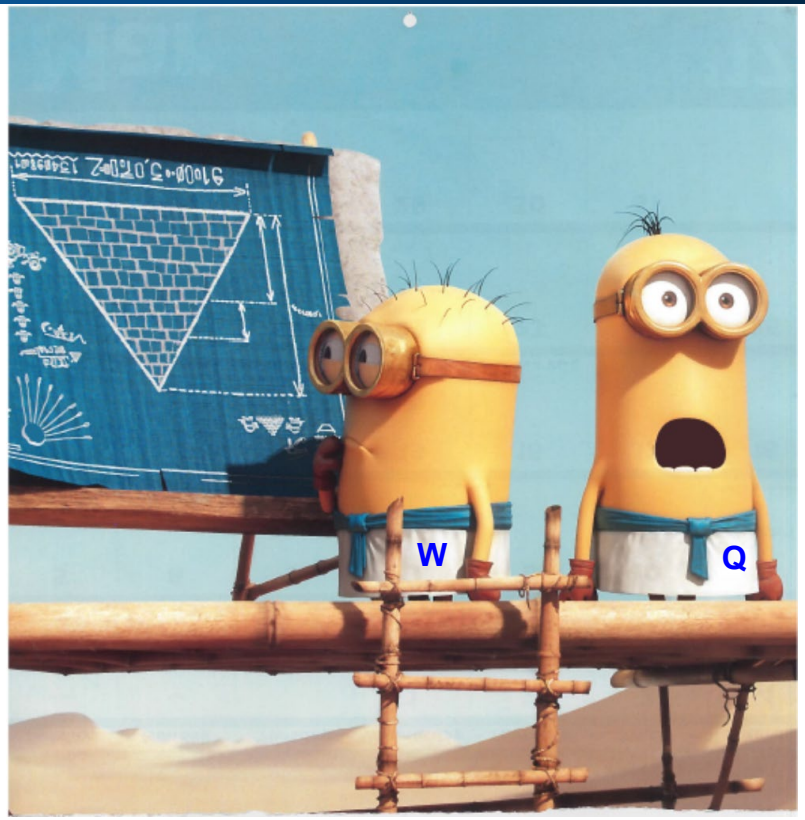
Nuclear Accidents

Glen “bigkaboom” McDuff
&
Keith “Doc Redneck” Thomas



75 Los Alamos NATIONAL LABORATORY EST. 1943

NNSA National Nuclear Security Administration
Operated by Triad National Security LLC for the U.S. Department of Energy's NNSA

Wait, What, We have accidents???

Accidents, Incidents, Mishaps

- Accident / Broken Arrow
  - Accidental or unauthorized launching, firing, or use by U.S. forces or supported allied forces of a nuclear-capable weapon system that could create the risk of an outbreak of war;
  - Nuclear detonation;
  - Nonnuclear detonation or burning of a nuclear weapon or radioactive weapon component, including a fully assembled nuclear weapon, an unassembled nuclear weapon, or a radioactive nuclear weapon component;
  - Seizure, theft, or loss, including jettison, of a nuclear weapon or radioactive nuclear weapon component;
  - Public hazard, actual or implied.

More on major accidents shortly

Accidents, Incidents, Mishaps

- Bent Spear
  - Any nuclear weapon significant incidents other than nuclear weapons accidents that do not create a risk of war, detonations, actual or possible
- Dull Sword
  - Any nuclear weapon incident other than significant incidents that could impair there operation

Accidents, Incidents, Mishaps

- Accidents involve:
  - Mishandling of trainer or live weapons such as inadvertent arming
  - Inadvertent firing of detonators during test
  - Using incorrect parts leading to breakage of weapon or weapons components, such as incorrect length bolts which results in damage to weapon
  - Wiring Errors found in testing
  - Fire or fire damage
  - Dropping live weapons (happens quite frequently)

Ooopps… a bad day

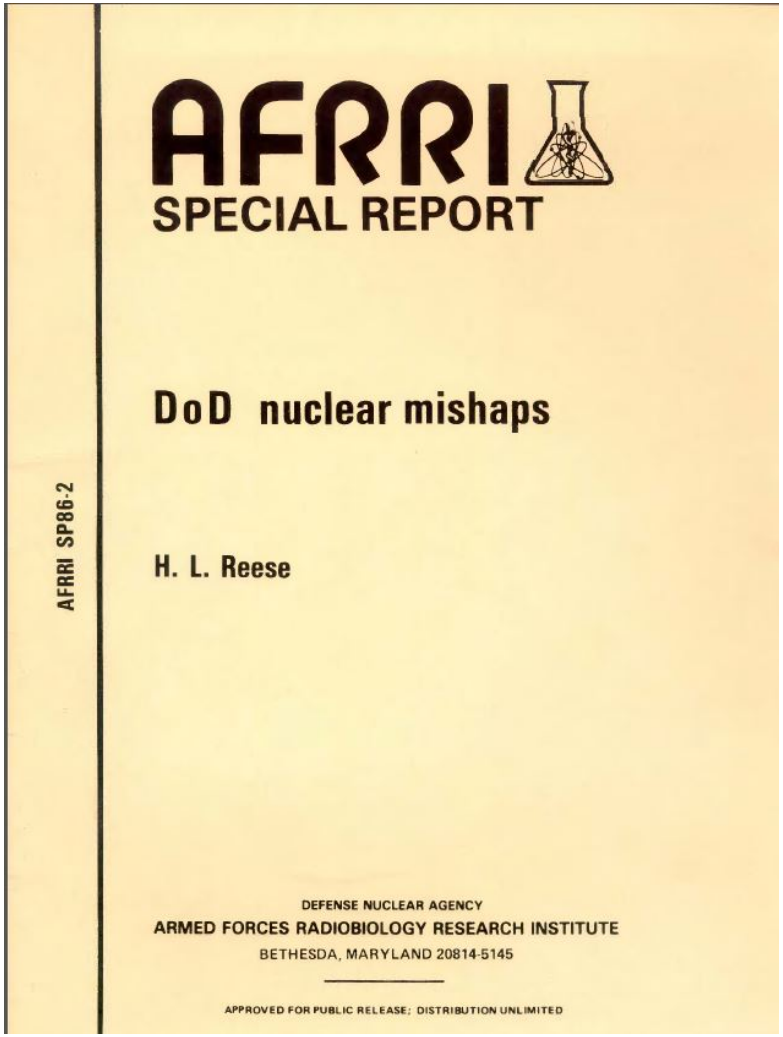
2 for the price of 1

Accidents, Incidents, Mishaps

- The Department of Defense has official designated 32 mishaps as nuclear weapon accidents
- There is one accident that has not officially been designated as an accident but is declassified.
- In reality, there are several thousand accidents reported, some of these are documented in the “Technical Letter 20-3, 15 Oct 1967, 228 pages detailing accidents and incidents in the ten year period from 1957 through 1968.
- The classified version “Technical Letter 20-3” is found in the “Accident” folder in the WESH share drive on the red network.
- A redacted version released through a FOIA request DoD FOIA D00012304 is in the “Accident” folder in the WESH share drive on the yellow network and online.
- DoD reported 1243 mishaps had occurred by 1973.

Accidents, Incidents, Mishaps

- The official list of major accidents released by the DoD, a copy is available for those interested.
- These accidents are documented in "XXXXX" and SRD publication and in the "AFRRI Special Report, "*DoD nuclear mishaps*", AFRRI SP86-2, March 1986.
- Much accident information was declassified in the early 2000's.
- Both of these documents are located in the WESH share drive.



Accidents, Incidents, Mishaps

- Hand out accident list
- Why were these chosen to publicize?
- Maybe these were hard not to notice?
- The accident in the list……

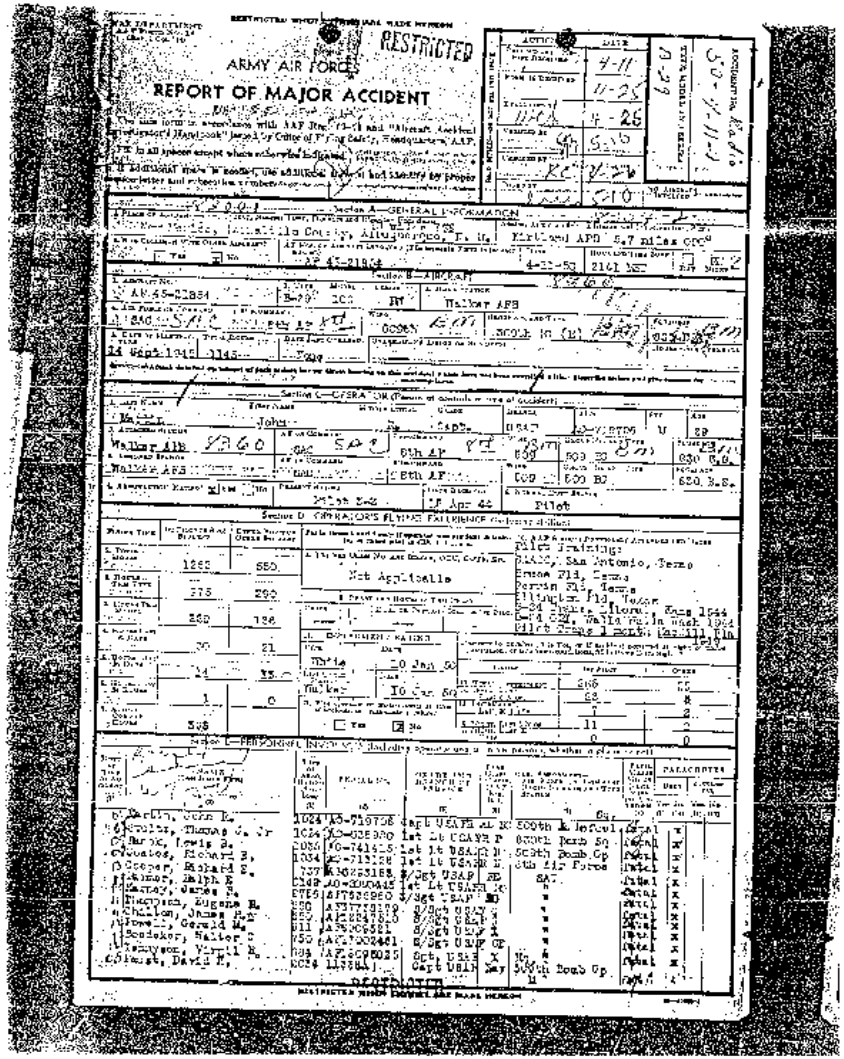
Accidents, Incidents, Mishaps

- Hand out of Official Accidents

Accident Number	Date	Location	Weapon	Type of Accident
1	02/13/50	Puget Sound, WA	B4	Jettison 8000'
2	04/11/50	Manzano Base, NM	B4	Crash into mountain
3	07/13/50	Lebanon, OH	B4	Crash in dive
4	08/05/50	Fairfield-Sulsan AFB, CA	B4	Emergency landing , fire
5	11/10/50	Over Water outside U.S.	B4	Jettison
6	03/10/56	Mediterranean	Component	Aircraft lost
7	07/27/56	SAC Base	B47	B47 crashed into bunker
8	05/22/57	Kirtland AFB, NM	B-17	Inadvertent jettison
9	07/28/57	Atlantic	B5	Jettisons at 4500' & 2500'
10	10/11/57	Homestead AFB, FL	Mk15-0	Crash on takeoff, fire
11	01/31/58	SAC Base overseas	B36	Taxi exercise
12	02/05/58	Savannah, GA	Mk15-0	Mid-air collision, jettison
13	03/11/58	Florence, SC	Mk6	Accidental jettison
14	11/06/58	Dyess AFB, TX	B39	Crash on takeoff
15	11/26/58	Chenault AFB, LA	Mk15-2	Fire on ground
16	01/08/59	US base Pacific	B7	Fuel tank fire
17	07/06/59	Barksdale AFB, LA	B39	Crash on takeoff, fire
18	09/25/59	Off Whidbey, Is, WA	B7	Navy aircraft ditched
19	10/15/59	Hardinsburg, KY	Mk15-2	Mid-air collision, impact
20	06/07/60	McGuire AFB, NJ	W40	Missile fire
21	01/24/61	Goldsboro, NC	B39	Mid-air breakup
22	03/14/61	Yuba City, CA	B39	Crash after abandonment
23	11/13/63	Medina Base		Storage igloo at AEC base
24	01/11/64	Cumberland, MO	B53	Mid-air breakup, crash
25	12/05/64	Ellsworth AFB, SD	W56	Missile RV fell
26	12/08/64	Bunker Hill AFB, IN	B43 & B53	Taxi crash, fire
27	10/11/65	Wright Patterson AFB, OH	Component	Transport aircraft fire
28	12/5/65	At sea, Pacific	2 x B43	Aircraft rolled off elevator
29	01/17/66	Palomares Spain	4 x B28	Mid air collision, crash
30	01/21/68	Thule Greenland		Crash of abandonment
31	Spring 68	At sea, Atlantic	2 x W34	Lost weapons
32	09/19/80	Damascus, AK	W53	Missile fuel explosion

Typical Accident Report

- Accident report from the B-29 crash at Kirtland AFB 1950.
- The Mk 4 bomb is still laying where it came to rest on Manzano Mtn.

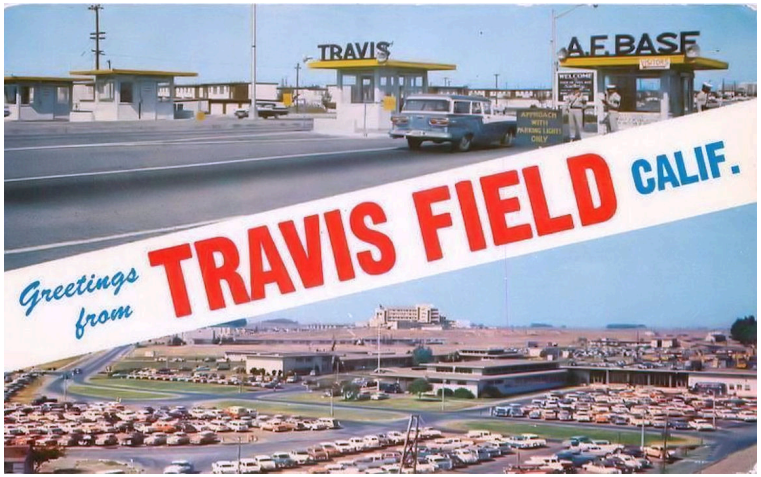

RESTRICTED

ARMY AIR FORCES

REPORT OF MAJOR ACCIDENT

The Worse Nuclear Accident

- In July 1950, soon after the outbreak of the Korean War, the Joint Chiefs of Staff decided to send ten nuclear-capable B-29 bombers to Guam as a deterrent to a Chinese attack on Taiwan, and possible use in Korea.
- August 1950 B-29 loaded with a Mk 4 left Fairfield-Suisan AFB, California and crashed shortly after take off. There was a fuel fire on the ground and after 20 minutes, the Mk 4 detonated killing 7 rescuers.
- Gen. Robert Travis was one of 20 occupants on board.



A couple of the more notable accidents

WEATHER
FAIR, PARTLY CLOUDY today and tonight. Mild this afternoon, cooler tonight. High 58. Low 34. Details, Page 2.

Florence Morning News

READER'S TIP
OTHER PICTURES on the "bombing" at Mars Bluff yesterday afternoon are on Page 10.

VOL. XXXIV—NO. 355 FLORENCE, S. C., WEDNESDAY MORNING, MARCH 12, 1958 DAILY 5c; SUNDAY 10c

ATOM BOMB WITHOUT WARHEAD DROPS IN MARS BLUFF SECTION

SCENE OF DISASTER — Walter Gregg was peacefully working near this truck at the back of his home in the Mars Bluff community when an explosion disrupted the tranquility. Here's what was left after the smoke cleared. At right was garage, which was shattered, and back of house behind the truck. Even some of the clothes hanging at left were shredded on the line.
(Morning News photo by Ballard)

Nobody Quite Believed It, Others Were Just Too Close

By JOHN RAY
Morning News Staff Writer

The tremendous blast and mushrooming column of smoke at Mars Bluff yesterday spread a rumor that an atomic bomb had been dropped — but nobody could quite believe it... at first.

Many shrugged the explosion off as another sonic boom created by a jet. Others heard the explosion, yet felt no effect. Only a few persons in Florence reported hearing it.

Highway Pilot, D. D. Mobley, one of the first at the scene, was enroute to his office from a station near Dillon when his car became overheated, forcing him to stop on the side of Highway 301.

"I pulled off the road and heard the explosion," he said. "It was like a whoosh, a tremendous blast that shook my car. It shook me for an instant. I didn't know what happened. I saw a big hole and went about halfway up but stayed away from it. I returned to the car and made my report by radio."

J. W. PRICE, service station
Continued on Page 10

Officials Say 'No Danger' Of Atom Blast

By C. YATES MCDANIEL

WASHINGTON (AP)—Defense Department officials said Tuesday night there was no danger of an atomic explosion and only a "remote" danger of nuclear contamination in the accidental dropping of an unarmed atomic bomb.

The explosion that damaged six houses and a church in the outskirts of Florence, S.C., today came not from any nuclear reaction but from conventional TNT, which is a part of the trigger mechanism of the bomb.

The remote danger of contamination referred to by the officials could arise from the exploding TNT scattering nuclear materials. The danger to humans, in such a case, could occur if atomic dust were taken internally—by breating it in or through an open cut in the skin.

Such atomic materials, however, cannot explode except when the chain reaction required for detonation is deliberately started by crew members in the atomic bomber.

Officials said the small area which would be contaminated in such a case could be cleaned up through a simple washing process.

An unarmed atomic bomb, such as the one dropped at Florence, is one in which the complicated mechanisms required to set off a nuclear chain reaction have not been connected and therefore cannot produce a nuclear explosion. The bomb which fell near Florence, however, contained all of the element that would be used in an actual military attack except the warhead.

Air officials have repeatedly said that a certain portion of the

HERE'S WHERE BOMB STRUCK . . . reported 20 feet deep
(Morning News photo by Kirkland)

Six Injured By Explosion; Windows Shake

A B-47 bomber dropped a nuclear weapon — minus its atomic warhead — into the garden of Walter Gregg's home at Mars Bluff yesterday afternoon, setting off an explosion that injured six persons. Its psychological impact, was heard around the world.

The explosion shattered windows of at least a dozen homes and stores in the thinly populated rural area.

Mount Mizpah Baptist Church looked like vandals had worked it over. Benches were collapsed, glass was strewn like powder over the auditorium, and portions of the roof were sticking jaggedly into the air.

A Florence salesman, J. A. Sanders, traveling on Highway 301, said the concussion was so great it turned his auto around in the road.

Portions of the weapon were found 700 yards from the crater.

Newsmen got in for a close inspection before the Air Force arrived and sealed off the area.

Through it all, one Negro family, living in an unpainted tenant house some 600 yards from the blast, stayed indoors. The children played nonchalantly.

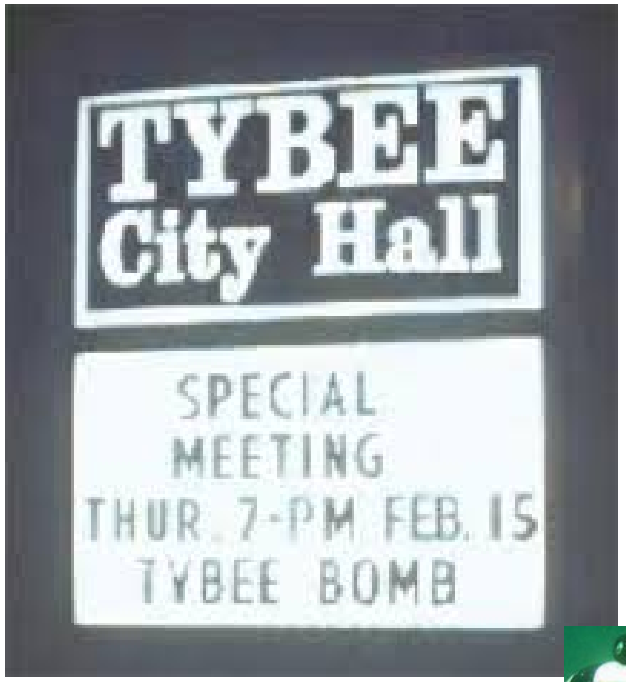
THE AIR FORCE would provide few details about the incident other than to say the weapon dropped because of a "mechanical malfunction of the plane bomb lock system."

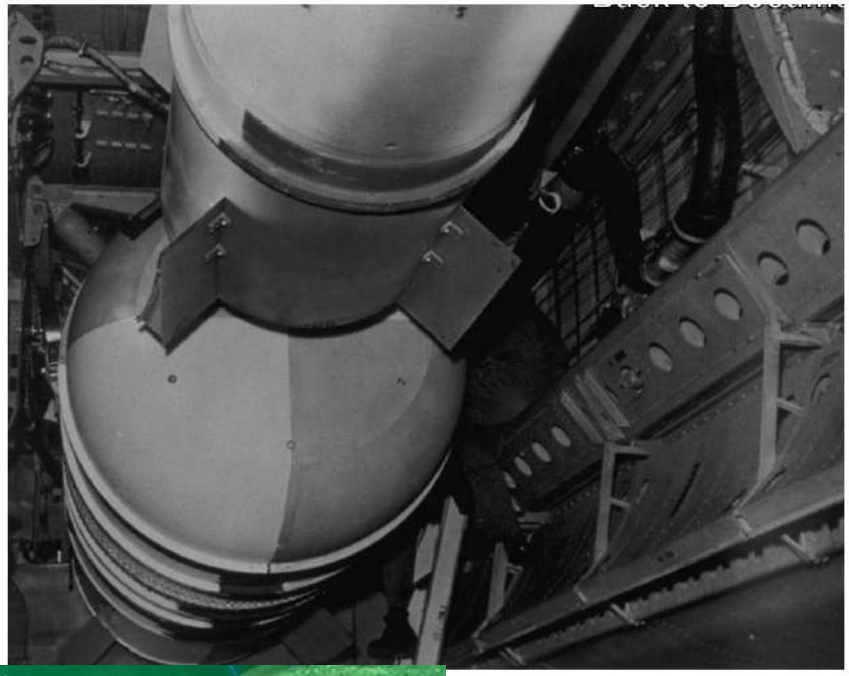
However, a private pilot flying into Florence about the time of the explosion reported a radio conversation between the Air Force pilot and the CAA.

The Air Force plane reported

Walter Gregg's Unlucky Day

The Lost H-Bomb of Tybee Island





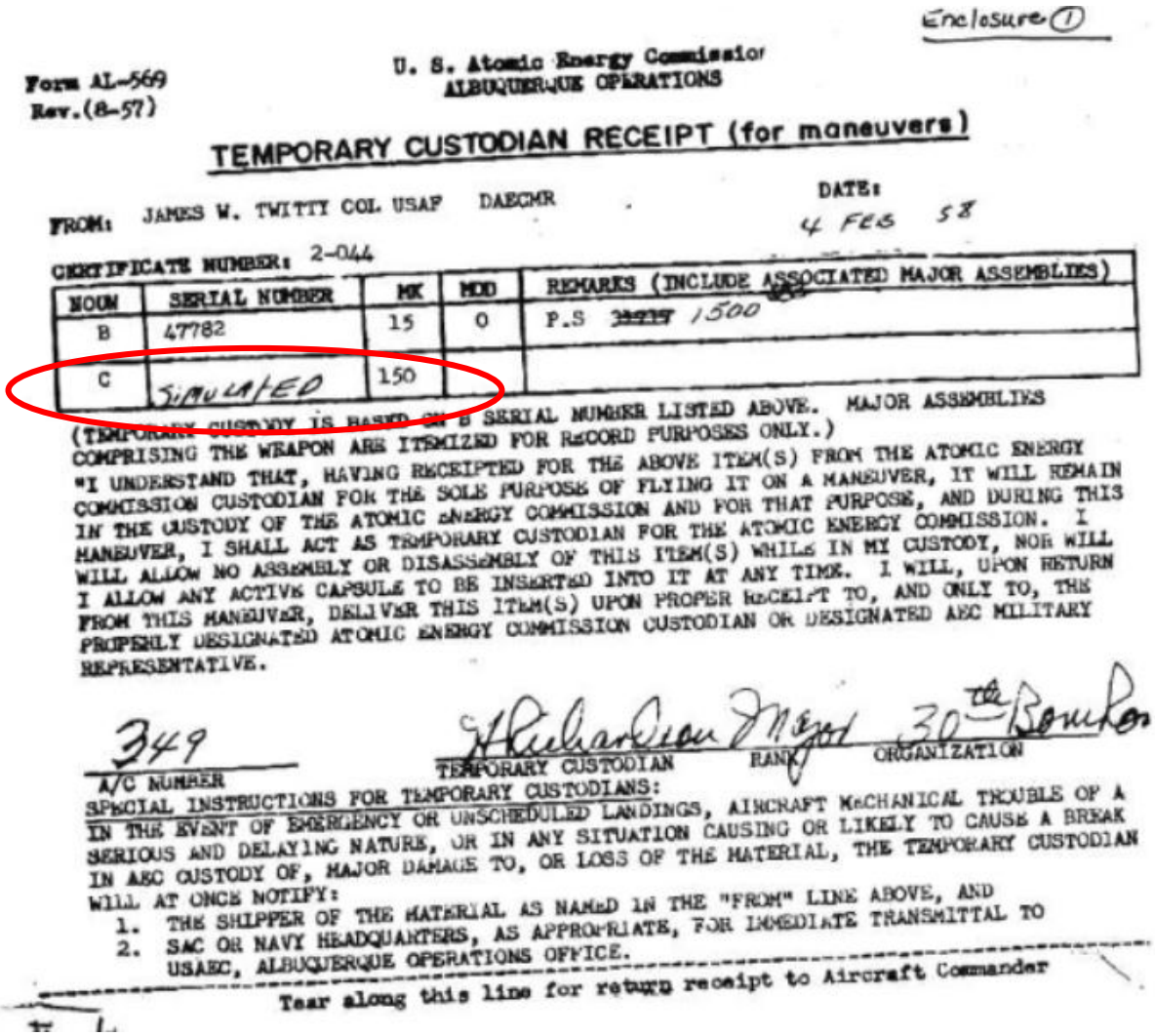
The Lost H-Bomb of Tybee Island

"5 February 1958 there was a midair collision resulting in the jettison of Mk15 Mod 0 bomb. *There was no capsule on board*."

B-47

F-86

There was no fissile material checked out!



Enclosure (1)

Form AL-569
Rev.(8-57)

U. S. Atomic Energy Commission
ALBUQUERQUE OPERATIONS

TEMPORARY CUSTODIAN RECEIPT (for maneuvers)

FROM: JAMES W. TWITTY COL USAF DAECMR

DATE: 4 Feb 58

CERTIFICATE NUMBER: 2-044

NOUN	SERIAL NUMBER	MK	MOD	REMARKS (INCLUDE ASSOCIATED MAJOR ASSEMBLIES)
B	47782	15	0	P.S 1500
C	SIMULATED	150		

(TEMPORARY CUSTODY IS BASED ON E SERIAL NUMBER LISTED ABOVE. MAJOR ASSEMBLIES COMPRISING THE WEAPON ARE ITEMIZED FOR RECORD PURPOSES ONLY.)

"I UNDERSTAND THAT, HAVING RECEIPTED FOR THE ABOVE ITEM(S) FROM THE ATOMIC ENERGY COMMISSION CUSTODIAN FOR THE SOLE PURPOSE OF FLYING IT ON A MANEUVER, IT WILL REMAIN IN THE CUSTODY OF THE ATOMIC ENERGY COMMISSION AND FOR THAT PURPOSE, AND DURING THIS MANEUVER, I SHALL ACT AS TEMPORARY CUSTODIAN FOR THE ATOMIC ENERGY COMMISSION. I WILL ALLOW NO ASSEMBLY OR DISASSEMBLY OF THIS ITEM(S) WHILE IN MY CUSTODY, NOR WILL I ALLOW ANY ACTIVE CAPSULE TO BE INSERTED INTO IT AT ANY TIME. I WILL, UPON RETURN FROM THIS MANEUVER, DELIVER THIS ITEM(S) UPON PROPER RECEIPT TO, AND ONLY TO, THE PROPERLY DESIGNATED ATOMIC ENERGY COMMISSION CUSTODIAN OR DESIGNATED AEC MILITARY REPRESENTATIVE.

349
A/C NUMBER

Richardson Major 30th Bomb
TEMPORARY CUSTODIAN RANK ORGANIZATION

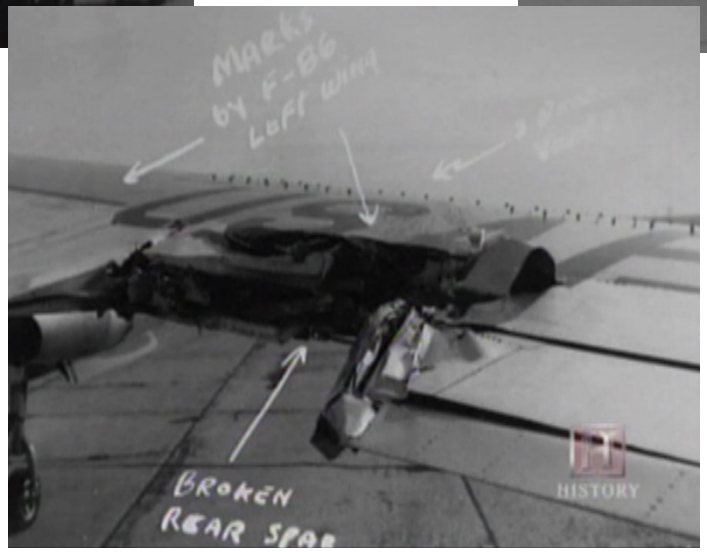
SPECIAL INSTRUCTIONS FOR TEMPORARY CUSTODIANS:

IN THE EVENT OF EMERGENCY OR UNSCHEDULED LANDINGS, AIRCRAFT MECHANICAL TROUBLE OF A SERIOUS AND DELAYING NATURE, OR IN ANY SITUATION CAUSING OR LIKELY TO CAUSE A BREAK IN AEC CUSTODY OF, MAJOR DAMAGE TO, OR LOSS OF THE MATERIAL, THE TEMPORARY CUSTODIAN WILL AT ONCE NOTIFY:

1. THE SHIPPER OF THE MATERIAL AS NAMED IN THE "FROM" LINE ABOVE, AND
2. SAC OR NAVY HEADQUARTERS, AS APPROPRIATE, FOR IMMEDIATE TRANSMITTAL TO USAEC, ALBUQUERQUE OPERATIONS OFFICE.

Tear along this line for return receipt to Aircraft Commander

Damage to the B-47 was unbelievable



Sealed pit weapons brought about new concerns

The Goldsboro Bomb

Primary Sources of Accidents

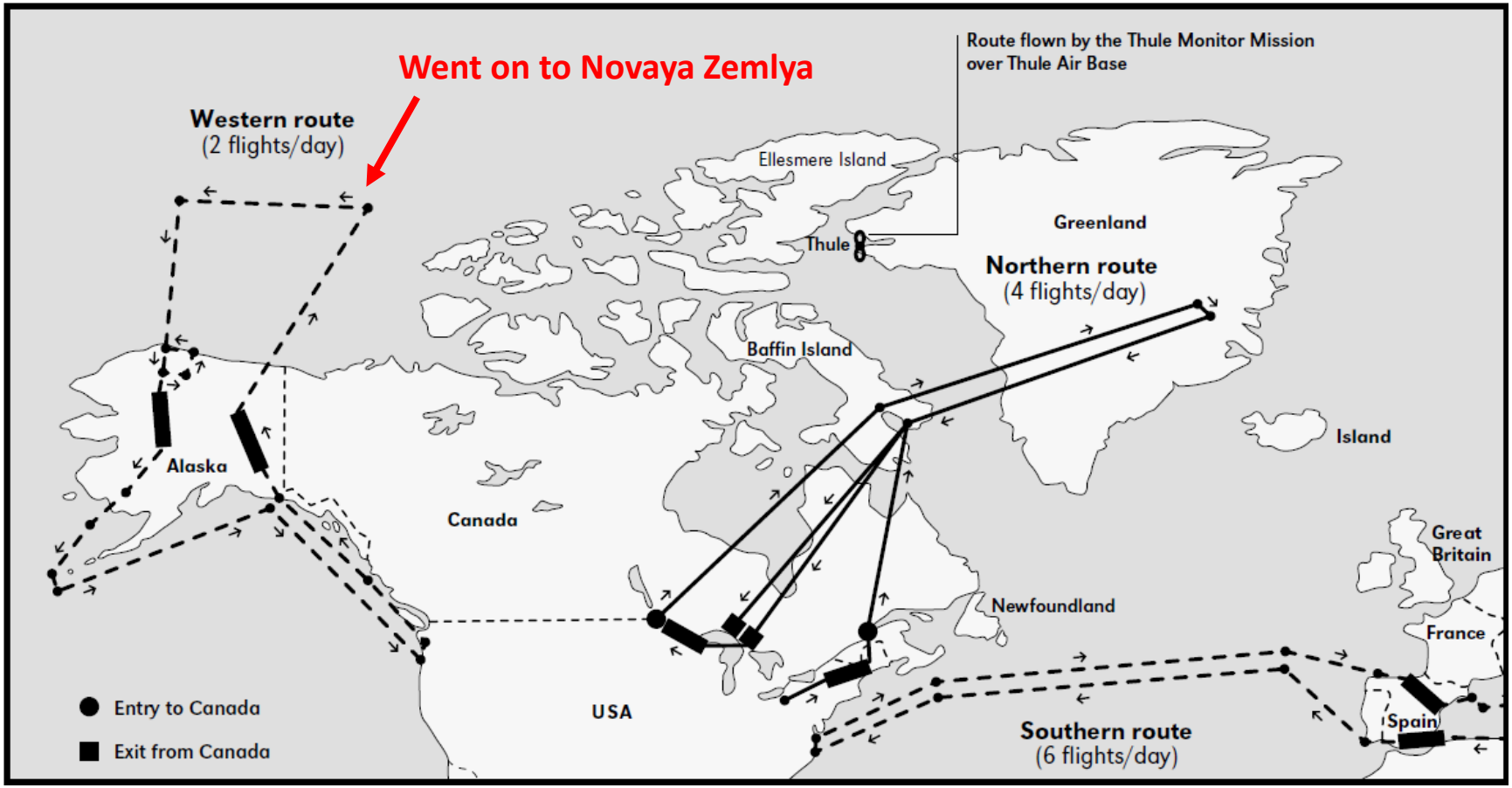
- Strategic Air Command (SAC) Airborne Alerts
- Up to ½ entire bomber fleet (800-1000) could be deployed in less than 15 minutes
- - Operation Reflex Action (initiated 1 Oct 1957)
  B-47's: 90-day rotations to England, Spain, and North Africa – mid-air refueling from the Azores
- Accidents:
  - Mar 56 (Mediterranean)
  - Jul 56 (OCONUS SAC)
  - Oct 57 (Homestead AFB)
  - Jan 58 (OCONUS SAC)
  - Mar 58 (Florence SC)
  - Nov 58 (Dyess AFB)

Continued Sources of Accidents

- Strategic Air Command (SAC) Airborne Alerts
  - Operation Chrome Dome

    B-52's: 1961 – 1968, up to 24 hour missions
- Mission Routes:
  - Northern (Central U.S. to Novaya Zemlya)
  - Southern (Eastern U.S. to Mediterranean)
  - Western (Western U.S. to Aleutian Chain)

Operation Chrome Dome



Side Note: During this time the Air Force performed an in-flight refueling somewhere about every 6 minutes

Operation Chrome Dome

- Strategic Air Command (SAC) Airborne Alerts
  - Operation Chrome Dome
- Accidents:
  - Oct 59 (Hardinsburg KY)
  - Jan 61 (Goldsboro NC)
  - Mar 61 (Yuba City CA)
  - Jan 66 (Palomares Spain)
  - Jan 68 (Thule Greenland)

On Alert Aircraft

- For 20+ years the U.S. and it's NATO allies had aircraft on alert 24 hours a day.
- The goal was to put aircraft in the air, armed with a nuke, within ~10 minutes of order.
- Often the aircraft had a shorter service interval than the nuke, example A4D aircraft with Mk 7 gravity bomb.

Douglas A4 with Mk 7 Bomb

- Schedule Service Intervals
  - Plane: ~24 hours
  - Bomb: ~ 72 hours

Typical "On Alert" Incident

Accident #1: [redacted]

1. During an Operational Readiness Manuever, an A4D-2 Aircraft departed from an aircraft carrier to deliver a Mk 7 Weapon to a land based ammunition depot. Personnel at the depot, in the course of a final assembly test, discovered approximately two gallons of JP5 fuel in the bottom of the weapon case.

2. The fuel was removed and inspection revealed that cables and IFI limit switches were fuel saturated and fuel was present under the high explosives sphere case and in the tail of the weapon. The fuze, fire sets, radars, etc., were not affected.

3. No storage inspection was performed because of the possible hazard due to arcing during electrical tests.

4. Investigation showed that a fuel leak was present in the aircraft. The leak was located in the Aero 7A Bomb Fuel Transfer Valve coupling.

5. The cause of the fuel leak was found to be an error made when the center line fuel tank was removed. When the tank was removed, the centerline fuel transfer valve should have been capped with a plug to preclude leakage and entry of foreign matter.

"On Alert" Incident, cont.

6. The rate of fuel leakage from the transfer valve was quite slow and not discernible to a casual observer; however, over a 16 hour period, the weapon had accumulated the amount of fuel which was discovered.

7. Due to the hazard which could exist because of the possible presence of fuel in the electrical system of the weapon, it was returned to AEC custody for closer examination and disposition.

8. Immediate corrective action was taken to preclude recurrence of identical accidents as follows:

a. Plugs have been requisitioned for all aircraft.

b. Procedures have been established to require a check for presence of the plugs prior to weapon loading.

Why did the fuel get through the O-ring seal?

Service Intervals

- What are the service intervals?
- What determines the service intervals?
- Who is responsible for the service intervals?
- Are they dependent on deployment location, environment, security, etc?

Accidents, **Incidents**, Mishaps

- Incidents
  - an increase in possibility of explosion or radioactive contamination;
  - errors committed in the assembly, testing, loading or transportation of equipment, and or the malfunctioning of equipment and material which could lead to an unintentional operation of all or part of the weapon arming and/or firing sequence, or which could lead to a substantial change in yield, or increased dud probability
  - any act of God, unfavorable environment, or conditions resulting in damage to the weapon, facility or component

Incidents

- Incidents involve:
  - Inspection deficiencies
    - Damaged bolts heads
    - Cracked or dented weapon parts such as access doors and fins
  - Improper securing of weapon in transport
  - Improper operation of weapon components during standard maintenance such as malfunctioning barometer or timer or Ready/Safe device.
  - Failing to secure weapon, such as rolling a few inches
  - Scratches
  - Cracked or damage insulation or wiring
  - Leaky containers or storage area, AND…….

Incidents

Typical Incident Report*

(which was leaked to the press)

Accident #39:

1. This accident involved exposure to a fire of the following items:
    a. 1 each - T-4 ADM (War Reserve).
    b. 1 each - 992TZ (Training).
    c. 1 each - ·992PZ (Training}.
    d. 1 each - H-205 Core Stand.

2. The fire originated in a faulty heating unit in a storage building and ignited a quantity of 762 mm rocket motors. The intense heat from the burning rocket motors caused the following damage to the above items:
    a. The T-4 explosives burned and the metal parts were subjected to intense heat.
    b. The M-102 Carrying Cases were discolored by the heat.
    c. Cushioning materials of the H-205 were burned.

*See newspaper article

Typical Incident Report

Incident #26: [redacted] DASA Code 503A42

Date - Unknown

1. During an annual inspection of an XM60 Atomic Demolition Munition, it was observed that the 1E23 Dummy Detonator bridgewires had been fired.

2. Investigation of the circumstances under which the detonators were fired is not complete.

Incident #27: [redacted] DASA Code 503H52

Date - Unknown

1. An M423, 8-inch Training Projectile was being transported over rough terrain on an M109 Van when the webbing and wood support which holds the training projectile in a vertical position failed. The container sustained a hole approximately 1/2-inch in diameter approximately 10-inches from the top of the container.

2. Cause of the incident is attributed to equipment failure.

That's our story and we're sticking with it!!

Where was NES?

Accident #5: (S~~RD~~)

This accident involved inadvertent firing of inert Mk 17 Mod 1 Weapon detonator bridge wires during test. The following sequence of events occurred:

What is the yield of a Mk17?

a. Arm Baro closed; Fire Baro open.

b. T-147 Tester was connected and DC power was applied.

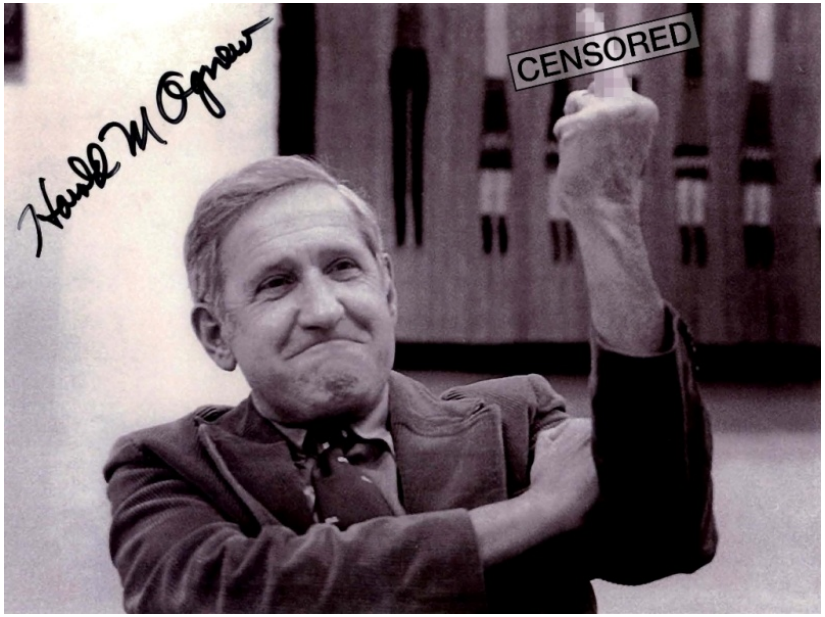
c. Arming and safing wires were removed from one bank of pull-out switches to simulate switch malfunction. This applied battery power to one side of the relays K3 and K4 in the fuse. At the same time, since the Fire Baro is opened, tester power is applied to the other sides of relays K3 and K4 through the Fire Baro monitor lines.

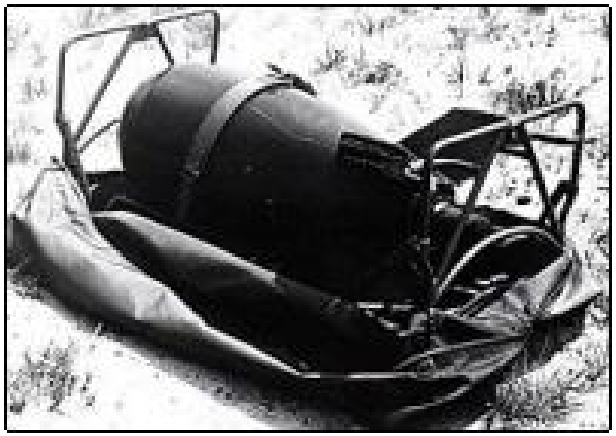
d. Arm switch was operated to Arm position. Since the pull-out switches and the Arm Baros were also closed, the inverters started and the X-Unit charged.

e. The T-147 DC Power Switch was placed in "off" position. This removed tester power from the relays K3 and K4 and allowed them to see ground through the monitor lights in the tester in parallel. The resultant current flow was sufficient to close the firing relays K3 and K4 which in turn closed the fire switch, dumping the X-Unit charge into the dets.

This is why we have inert trainers.

The Rattling Davy





"when out on the lawn there arose such a clatter, I sprang from the bed to see what was the matter"

From LAUR-19-29033

Do incidents still happen today?

Air Force Punishes 70 Airmen For Accidental Nuke-Armed B-52 Flight

Published October 20, 2007 · Associated Press

WASHINGTON – The Air Force said Friday it has punished 70 airmen involved in the accidental, cross-country flight of a nuclear-armed B-52 bomber following an investigation that found widespread disregard for the rules on handling such munitions.

"There has been an erosion of adherence to weapons-handling standards at Minot Air Force Base and Barksdale Air Force Base," said Maj. Gen. Richard Newton, the Air Force deputy chief of staff for operations.

Newton was announcing the results of a six-week probe into the Aug. 29-30 incident in which the B-52 was inadvertently armed with six nuclear-tipped cruise missiles and flown from Minot in North Dakota to Barksdale in Louisiana without anyone noticing the mistake for more than a day.

The missiles were supposed to be taken to Louisiana, but the warheads were supposed to have been removed beforehand.

What can the engineer do?

Good reading – (YCMTSU)

- This information release by DoD FOIA D00012304, “Technical Letter 20-3, 15 Oct 1967, 228 pages detailing over 1000 accidents and incidents from 1957 through 1968.
- Good tidbits for a weapon engineer to know
- On the share drive – Technical Letter 20-3 15 October 1967.pdf and online at DTIC

~~RESTRICTED DATA~~
ATOMIC ENERGY ACT 1954

~~SECRET/RD~~

APPENDIX I

TO

TECHNICAL LETTER 20-3, DATED 15 OCTOBER 1967

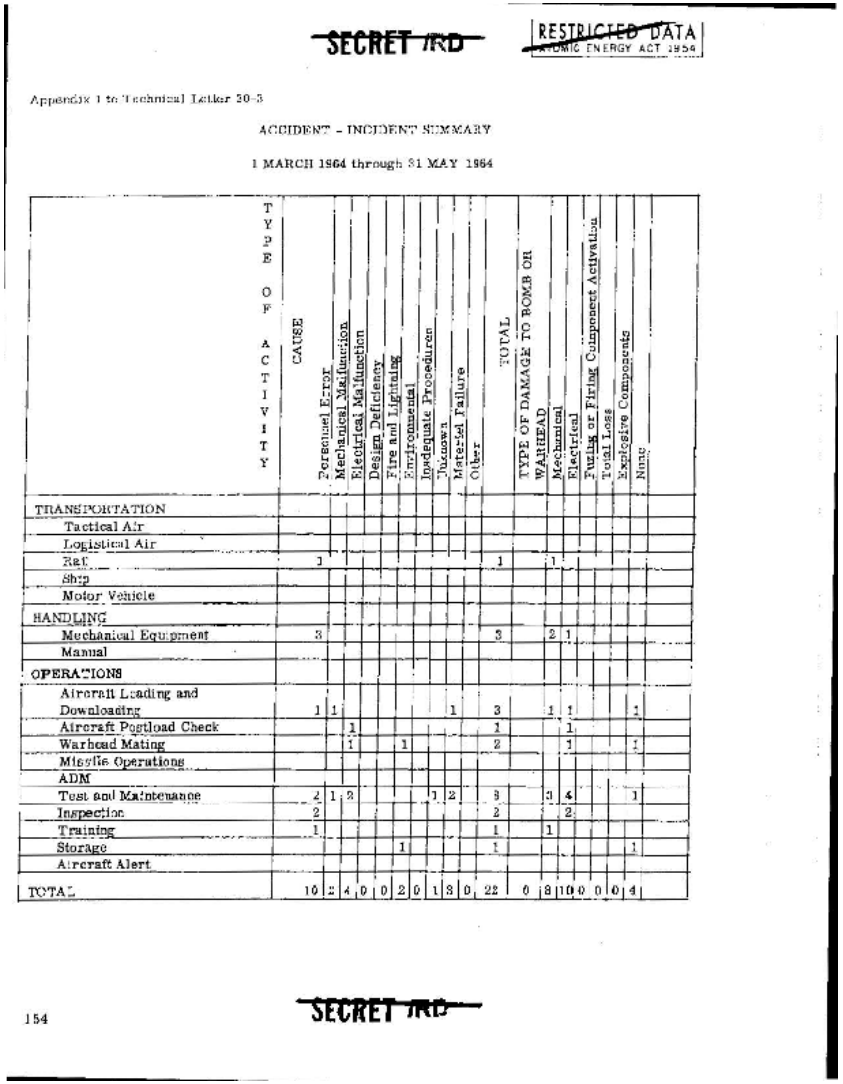
Accidents and Incidents During the Period 1 July 1957 through 31 March 1967

Accident #1: (C~~RD~~)

A Mk 6 Mod 4 inert training weapon was being off-loaded from a bomber aircraft. Red arming plugs were in the weapon, the fuzing baro was closed, and the arming wires were not disconnected from the aircraft. When the weapon was lowered, the arming wires were extracted, the normal firing sequence was initiated, and the detonator bridge wires were fired. Accidents very similar to this and identical in end result have been reported on three occasions from different sources.

Incident Quarterly Report

- From 1 March 1964 through 31 May 1964 the were 44 reportable incidents
- This information is included in DoD FOIA D00012304, “Technical Letter 20-3, 15 Oct 1967, 228 pages detailing accidents and incidents from 1957 through 1968.
- This document gives the engineer a thorough look at the day-to-day rigors a nuclear weapons experiences or “weapon activities”



~~SECRET IRD~~ RESTRICTED DATA ATOMIC ENERGY ACT 1954

Appendix 1 to Technical Letter 20-3

ACCIDENT - INCIDENT SUMMARY

1 MARCH 1964 through 31 MAY 1964

TYPE OF ACTIVITY	CAUSE										TOTAL	TYPE OF DAMAGE TO BOMB OR WARHEAD					
	Personnel Error	Mechanical Malfunction	Electrical Malfunction	Design Deficiency	Fire and Lightning	Environmental	Inadequate Procedures	Unknown	Material Failure	Other		Mechanical	Electrical	Firing or Firing Component Activation	Total Loss	Explosive Components	None
TRANSPORTATION																	
Tactical Air																	
Logistical Air																	
Rail	1									1			1				
Ship																	
Motor Vehicle																	
HANDLING																	
Mechanical Equipment	3									3		2	1				
Manual																	
OPERATIONS																	
Aircraft Loading and Downloading	1	1							1	3		1	1			1	
Aircraft Postload Check			1							1			1				
Warhead Mating			1			1				2			1			1	
Missile Operations																	
ADM																	
Test and Maintenance	2	1	2					1	2	3		3	4			1	
Inspection	2									2			2				
Training	1									1		1					
Storage					1					1						1	
Aircraft Alert																	
TOTAL	10	2	4	0	1	0	2	0	1	18	0	22	0	8	10	0	0	4

154

~~SECRET IRD~~

Weapon Activities (from days gone by)

- **TRANSPORTATION**
  - Tactical Air
  - Logistical Air
  - Rail
  - Ship
  - Motor Vehicle
- **HANDLING**
  - Mechanical Equipment
  - Manual
- **OPERATIONS**
  - Aircraft Loading and Downloading
  - Aircraft Postload Check
  - Warhead Mating
  - Missile Operations
  - ADM
  - Test and Maintenance
  - Inspection
  - Training
  - Storage
  - Aircraft Alert

- **CAUSE**
  - Personnel Error
  - Mechanical Malfunction
  - Electrical Malfunction
  - Design Deficiency
  - Fire and Lightning
  - Environmental
  - Inadequate Procedures
  - Unknown
  - Material Failure

- **TYPE OF DAMAGE TO BOMB OR WARHEAD**
  - Mechanical
  - Electrical
  - Fuzing or Firing Components
  - Explosive Components
  - Total Loss
  - None

What about today?

- What type of environment might your weapon experience:
  - high humidity for years or decades
  - being in a flooded bunker
  - next to a heater such that it is heated on one side
  - in an un-air conditioned bunker where temperatures may reach >180F
  - bounced around on runways full or cracks, patches, and pot holes.
  - DROPPED
  - 

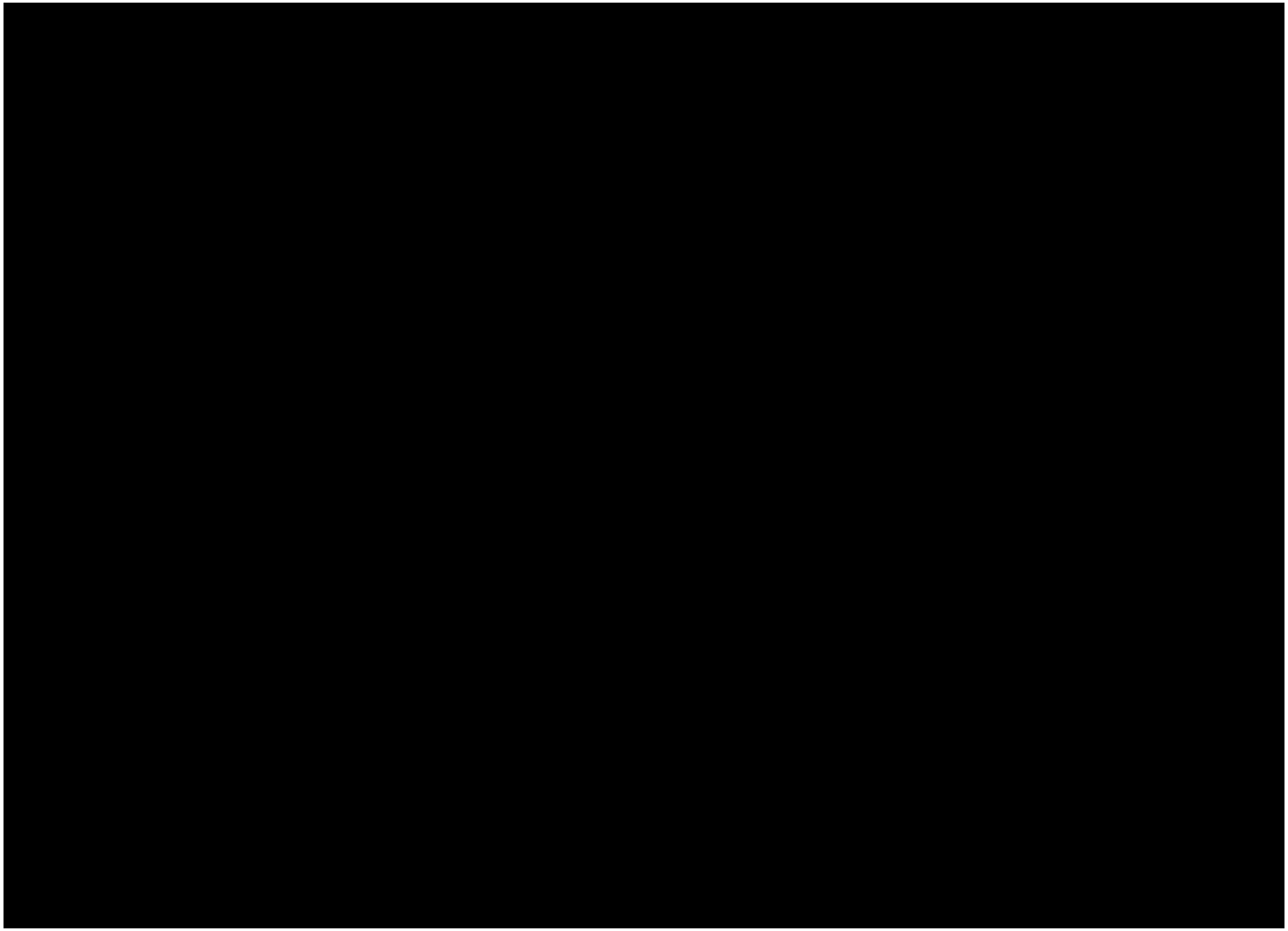
Palomares, Spain – Jan 17, 1966

- B-52 bomber
- (4) Mk28 warheads
- During mid-air refueling operation planes collide & explode
  - 4 men on tanker & 3 (of 7) on B-52 killed

Palomares, Spain

Bonus points for guessing the voice of the narrator

Bonus points for pointing out what's wrong in the first scene



What happens to the bombs?

- 3 fall onto the land
- 1 in the ocean
- 2 of the 3 explode on impact – spreading Pu
- Clean-up started & continues
- Where is the dirt?

2 Mk28 from Palomares at ABQ Museum

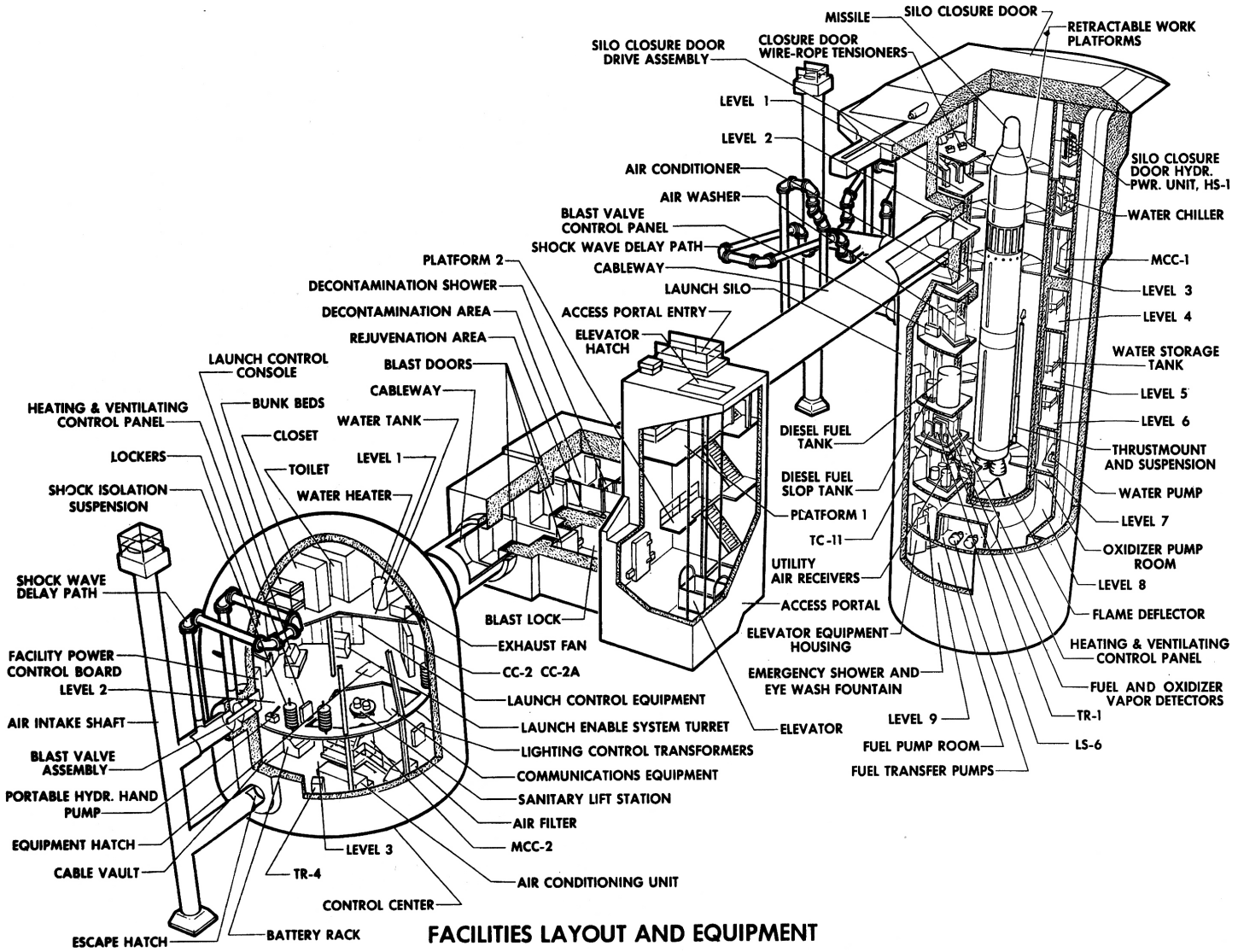
Damascus, Arkansas – Sept 18-19, 1980

- ***Titan II Missile***
  - Designed to launch after Russian 1st Wave
  - Liquid fuel rocket
  - 2-part fuel that is toxic
  - 100+ feet high
  - 3 ft diameter
  - ~340,000 lbs
- ***W53 Warhead***
  - BIG thermo-nuke bomb!!!!
  - ~9 Megaton*

*Declassified 28 Nov 2014

Mindset of a Missilier

Titan II Missile Complex



FACILITIES LAYOUT AND EQUIPMENT

Complex 374-7 Before Explosion

Sequence of Events – 18 Sept 1980

- @ 1827: During maintenance on the missile a socket was dropped
  - Note socket weighed ~ 8 lbs
- Fell ~ 80 ft striking the missile causing a leak
  - ~ 30 seconds noticeable amount of fuel observed
- (See Command & Control movie)
- Quick summary – USAF trying to figure out what to do
- Early morning 2 airmen enter facility
  - Sensors showed explosive environment
  - Crew evacuated
  - Concern over rocket collapsing
- @0300: Airman re-entered to turn-on exhaust fan
- **Fuel explodes**
  - SrAirman Livingston killed
  - 21 others injured
- **740 ton Blast door thrown ~ 200 yards**
- **Upper stages ejected from silo including warhead**
- **2nd stage explodes above silo**
- **Warhead propelled 100's of feet**

Damascus, Arkansas

Wow, it's batman again!!

Silo after explosion

Do not count on Sandia Nuclear Safety to save us

(according to Sandia)

If you want your own Titan II silo, you're in luck

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Weapon Activities Future

- With the USAF considering putting B-52 back on 24 alerts, many engineering aspects of nuclear weapons that may have been neglected in the last 25 years may again be very relevant.

U.S. Air Force Preparing to Put B-52 Nuclear Bombers on 24-Hour Alert

POPULAR MECHANICS **Jay Bennett**

Popular Mechanics October 23, 2017

Operation Reflex-Action Part 2 ?

Weapon Activities Future Discussion

- How would adding 24 hour alert impact what you do?

- Quality?
- Testing?
- Shipping?
- Environmental?
- Other?

Remember this slide?

Air Force Punishes 70 Airmen For Accidental Nuke-Armed B-52 Flight

Published October 20, 2007 · Associated Press

WASHINGTON – The Air Force said Friday it has punished 70 airmen involved in the accidental, cross-country flight of a nuclear-armed B-52 bomber following an investigation that found widespread disregard for the rules on handling such munitions.

"There has been an erosion of adherence to weapons-handling standards at Minot Air Force Base and Barksdale Air Force Base," said Maj. Gen. Richard Newton, the Air Force deputy chief of staff for operations.

Newton was announcing the results of a six-week probe into the Aug. 29-30 incident in which the B-52 was inadvertently armed with six nuclear-tipped cruise missiles and flown from Minot in North Dakota to Barksdale in Louisiana without anyone noticing the mistake for more than a day.

The missiles were supposed to be taken to Louisiana, but the warheads were supposed to have been removed beforehand.

The Sec. of the Air Force and several Generals were fired!!

What Message Does This Send to our Adversaries

- For 30 years we transported by air and flew nuclear weapons on aircraft and helicopters knowing they were not one-point safe.
- Now that all our weapons are one-point safe we don't allow them on aircraft or even trains!
- HMMM?

Not Quite, The Forgotten Accident

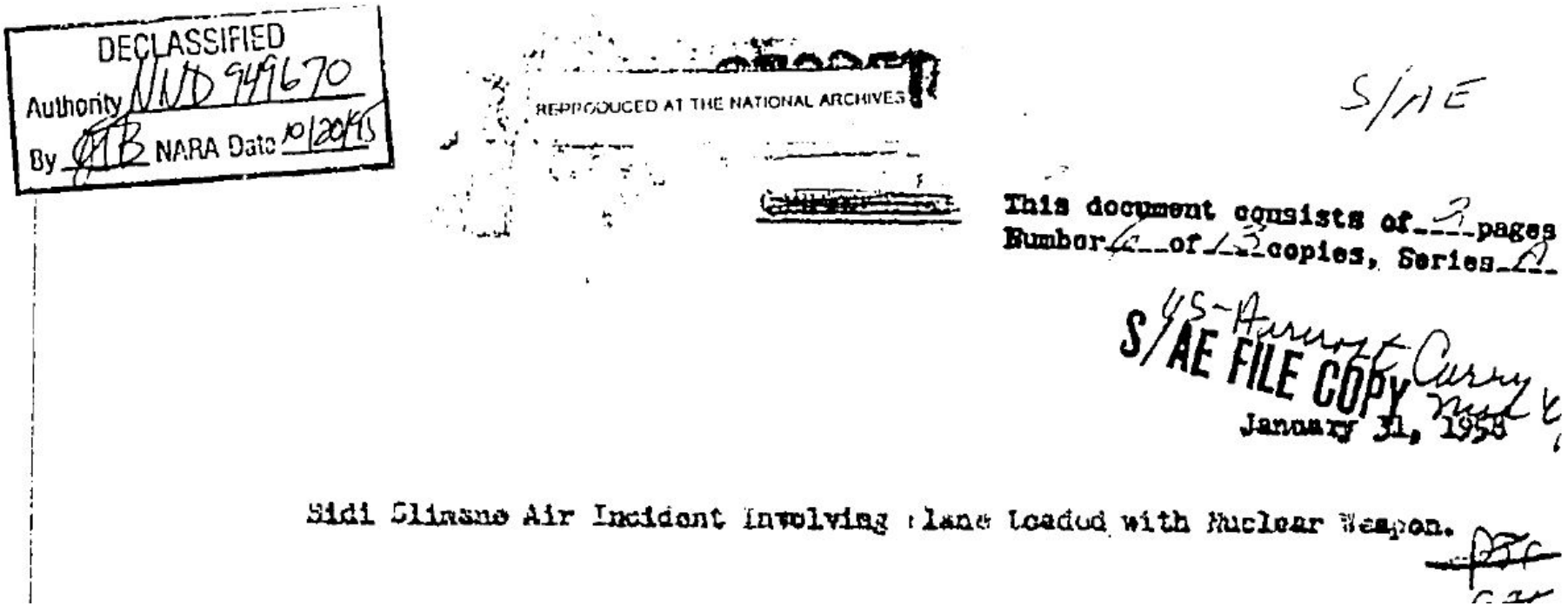
- In January 1958 a B47 bomber caught fire on takeoff and stopped on the runway.
- Firefighters applied fire retardant for a few minutes then evacuated with everyone else in the base and surrounding city.
- The fired burned for several hours. No detonation!
- But the bomb melted into a giant blob of material.
- It was decided to keep this accident secret due to its location.
- Where?

Sidi-Slimane Air Base in Morocco

- The U.S. had up to 100 B47 nuclear bombers stationed in North Africa.
- Only the King of Morocco was told of the accident.

General White telephoned me in the absence of Mr. Morphy to say that a B-47 loaded with "one of those things" had just crashed (b)(3):42 USC 2168(a)(1)((b)(3):42 USC 2168(a None of the crew were injured, there was no explosion, no radiation and no harmful effects whatsoever. The General also said that a representative (b)(3):42 USC 2168(a)(1)(C)(knows about the crash and has inquired as to whether a nuclear bomb might have been aboard the plane. General White says that he and the Air Force feel that this is an excellent opportunity to issue a public statement regarding crashes of planes loaded with nuclear weapons and that such a statement could also have a beneficial effect on the similar problem being discussed (b)(3):42 US 's said that the Air Force

Declassification



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January 31, 1958

Sidi Slimane Air Incident Involving Plane Loaded with Nuclear Weapon.

Bureaucrats Respond Appropriately

This letter was about explaining why the evacuation was required.

This problem of the popular fear of accidental nuclear explosions is going to be a factor to contend with for some time, and it seems to me that, in addition to examining evacuation procedures, much can and should be done to educate the public. It is not surprising that the man in the street, who has grown accustomed to the idea of the fantastic power of nuclear weapons, should have the idea that nuclear weapons present a terrific accident hazard. Technical explanations cannot accomplish a great deal with the general public. What seems indicated is a series of popular articles, pictures and newsreels showing nuclear bombs being hacked up with axes.

I am getting somewhat too far afie … know where we stand on this evacuation quest …

All of the best to you and Ruth,

George L. West, Jr.

Special Thanks to Peter Kuran

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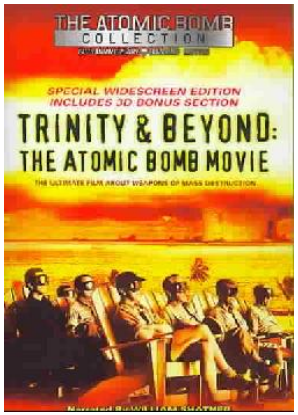

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